TABLE C1

I-680 / I-880 Cross Connector
Conceptual Study Report
Alternative Options Summary Matrix

	DESCRIPTION	BRAINSTORMING SUMMARY REPORT IMPROVEMENT	MOE[1] DATA AVAILABLE	MODEL RUN	MODEL COMBINATION RUN	EXISTING LANE CONFIGURATION	PROPOSED LANE CONFIGURATION	CONCEPT DRAWING CREATED	PSR LEVEL +/- COST ESTIMATE	DESIGN SPEED ON PROFILE	UTILITY IMPACTS ASSESSMENT	RIGHT OF WAY	DRAINAGE	# OF BRIDGES	"APS" EXISTING BRIDGE ONLY	DESIGN ISSUES	BRAINSTORMING ALT. #'s
A - AUTO MALL PARKWAY											✓	✓	✓				
A1 - Widen to 6 Lanes		✓															
a) A-Alt. 22-G1P1.dwg*†	Widen/At-grade		✓	✓	✓	EB 2 T WB 2 T	EB 3 T WB 3 T	✓	✓	N/A				2	2	1. 2 RT LN AMP EB to I-680 S. 2. 2 LT LN @I-680 Br.	22
b) A-Alt. 22-G2P1.dwg	Widen/At-grade															1. Improvements to include Osgood to Grimmer only. 2. Widen S side only, hold N side constant. 3. Impact undeveloped/underdeveloped areas including median. 4. Color strip map with major utilities shown. 5. Minimize (N) R/W.	22
A2 - I/C @ Osgood		✓														1. WidenI- 680 Br:2 LT LN ?	
a) A-Alt.80-G2P1.dwg	Tight Diamond						-	✓		✓				3	2	1. LT LN AMP WB to Osgood SB. 2. Minimize impacts to Fry's Plot. 3. Vacant lot at NW quad (AMP/O I/S) Check? 4. Bottleneck at Fremont I/S.	80
b) A-Alt.80-G3P1.dwg	S Square Loop						-	✓						1	1	1.Take out AMP EB SLoop ("AOF1" Line, new i/s @ Osgood) to I680 SB. 2. HOV by-pass lane on on-ramp?	80
c) A-Alt.80-G4P1.dwg			N/A	N/A										1			80
d) A-Alt.80-G5P1.dwg	Tight Diamond						-							1	1		80
e) Quad Alternative	Square Loop (No Grade-Separation)						-									1. Develop Square Loop Concept.	

1. MOE - Measures of Effectiveness (See Section VI.)

* Alternative Plotted for Conceptual Study Report.

† Recommended Alternative

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B - FREMONT/GRIMMER											✓	✓	✓				
B1 - Widen to 6 lanes for HOV		✓															
a) F-Alt 76-G1.dwg	Widen/At-grade		✓	✓	✓	EB 2 T WB 2 T	EB 3 T WB 3 T	✓	✓					1	1	1. Retaining walls required. Evaluate Bridge at I-680. 2. I-680 Connection N of Grimmer only. 3. Smart Corridor w/Fiber Optics. 4.Entry/Exit Radius to I-680 at F-G.	76
b) F-Alt 76-G1b.dwg *†	Widen/At-grade		✓	✓		EB 2 T WB 2 T	EB 3 T WB 3 T	✓								1. Retaining walls required. Evaluate Bridge at I-680. 2. Extend I-680 Connections S of Grimmer. 3. I-680 W (SB) Bridge requires ABUT DEMO (median) & widening on W (SB) side.	76
c) F-Alt 76-G1c.dwg	Widen/At-grade		✓	✓		EB 2 T WB 2 T	EB 3 T WB 3 T	✓								1. Retaining walls required. Evaluate Bridge at I-680. 2. Extend I-680 Connections S of Grimmer. 3. 680 W (SB) Bridge does not require ABUT DEMO (median) & widening on W (SB) side. 4. Reduce width of proposed connection till ABUT to 2-12' lanes + 2' median + 2-2' shoulders to utilize existing gap of 30' +/-. Full section per B1b to begin immediately past pinch point N & S of Grimmer on main line 680.	76
d) F-Alt 76-G1d.dwg	Widen/At-grade		✓	✓		EB 2 T WB 2 T	EB 3 T WB 3 T	✓								1. Retaining walls required. Evaluate Bridge at I-680. 2. Extend I-680 Connections S of Grimmer. 3. I-680 W (SB) Bridge does not require ABUT DEMO (median) & widening on W (SB) side. 4. Revised concept adds ramps (Grimmer to SB I-680 & I-680 SB to Grimmer w/HOV by-pass/metering). 5. Existing gap of 30' +/- accommodates Grimmer to NB I-680 & - I680 NB to Grimmer w/ 1-12' lane, & 2-10' shoulders N & S of Grimmer on main line I-680.	76
B2 - (N) Elevated Freeway		✓															
a) F-Alt5-G3B.dwg. 6 lanes.	Elev. 6 Lanes Freeway-2 HOV, 4 MF						-	✓						7	0	1. One main bridge with 6 on/off ramp bridges 2. Merge/Weaving operational analysis needed?	5
b) F-Alt5-G4.dwg. 4 lanes.	Elev. 4 Lanes Freeway-No HOV, 4 MF			✓			-	✓						4	0	1. Pb. Statement #3 Not met. 2. HOT LN possibility. 3. Weaving issues.	5
c) F-Alt5-G5.dwg. 2 lanes.	Elev. 2 Lanes Freeway (HOV Only)		✓	✓		EB 2 T WB 2 T	EB 3 T WB 3 T	✓	✓					1	0	1. Profile developed for this option.	5
d) F-Alt5-G6.dwg. 2 lanes*	Elev. 2 Lanes Freeway (HOV Only)		✓	✓		EB 2 T WB 2 T	EB 3 T WB 3 T	✓	✓					1	0		5

* Alternative Plotted for Conceptual Study Report.

† Recommended Alternative

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C - MISSION BLVD.											✓	✓	✓				
C1 - Tunnel		✓														1. Tunnel Fwy to Fwy only. 2. Surface - Local traffic. 3. HOV LN in tunnel?	
a) Mi-Alt.14-G1P1r2a.dwg	4 lanes. Fwy. to Fwy. Only. MIXED FLOW.		✓	✓		EB 3 T WB 3 T	EB 5 T WB 5 T	✓	✓							1. Use Warren I/C. 1. Avoid problematic movements. 2. SB I-880 local traffic to use Warren I/C. 3. Provide NB I-680 to I-880 movement in tunnel; FHWA likes freeway to freeway connection. No NB I-680 to I-880 movement in tunnel would bring less value to project. 4. Provide 5.1 m vertical clearance in tunnel?	14
a1) Mi-Alt.14-G1P1r2a1.dwg	4 lanes. Fwy. to Fwy. Only. MIXED FLOW.															Same as C1A & C1B.	
b) Mi-Alt.14-G2P1r2a.dwg	4 lanes. Fwy. to Fwy. only						-									1. Alternate tunnel Option 2. Avoid problematic movements. 3. SB 880 local traffic to use Warren I/C.	14
c) Mi-Alt.14-G3P1r2a.dwg			N/A	N/A			-									1. Alternate tunnel Option	14
d) Mi-Alt.14-G4P1r2a.dwg	4 lanes. Fwy. to Fwy. Only. HOV/HOT.		✓	2 HOV 2 MF?		EB 3 T WB 3 T	EB 5 T WB 5 T	✓								1. Tunnel Fwy to Fwy only-HOV/HOT LANES. 2. Surface - Local traffic. 3. HOV or HOT LN in tunnel?-Still unclear. Mood is towards HOV/HOT lanes. TAC # 19, 3/18/03.	14
C2 - I/C @ Warm Springs		✓															
a) Mi-Alt.25-G1P1.dwg	Single Point I/C													1	I		~~25~~
b) Mi-Alt.25-G2P1.dwg	Tight Diamond		✓	✓			-	✓	✓					1	1	1. Avoid problematic movements. 2. SB 880 local traffic to use Warren I/C. 3. Local to use Warren to I-880, Regional to use Mission to I-880.	25
b1) Mi-Alt.25-G2P1B1.dwg*	Tight Diamond							✓								1. Keep nb on & sb on loops at I I-680 i/c. Base case. No NB WS to WB Mission/I-880. No SB WS to (WB Mission/I-880 + Kato). No Kato EB to Mission & WS.	25
b2) Mi-Alt.25-G2P1B2.dwg	Tight Diamond															1. Keep nb on & sb on loops at I-680 i/c. Case 1. SB WS to Kato only. No NB WS to WB Mission/I-880. Mission EB to WS. No Kato EB to Mission & WS.	25

* Alternative Plotted for Conceptual Study Report.

† Recommended Alternative

TABLE C1

I-680 / I-880 Cross Connector
Conceptual Study Report
Alternative Options Summary Matrix

	DESCRIPTION	BRAINSTORMING SUMMARY REPORT IMPROVEMENT	MOE[1] DATA AVAILABLE	MODEL RUN	MODEL COMBINATION RUN	EXISTING LANE CONFIGURATION	PROPOSED LANE CONFIGURATION	CONCEPT DRAWING CREATED	PSR LEVEL +/- COST ESTIMATE	DESIGN SPEED ON PROFILE	UTILITY IMPACTS ASSESSMENT	RIGHT OF WAY	DRAINAGE	# OF BRIDGES	"APS" EXISTING BRIDGE ONLY	DESIGN ISSUES	BRAINSTORMING ALT. #'s
b3) Mi-Alt.25-G2P1B3.dwg	Tight Diamond															1. Keep nb on & sb on loops at I-680 i/c. Case 2. SB WS to Kato only. No NB WS to WB Mission/880. No Mission EB to WS. Kato EB to Mission & WS.	25
c) Mi-Alt.25-G3P1.dwg	Fly-over						-									1. Warm Springs Fly-Over (Through) Concept	
C3 - Reconfig 680 I/C * †	Parclo	✓	✓	✓	✓	2EB, 2EB	3EB, 3VB	✓	✓		✓	✓	✓	1		1. See C2b1 drawings @ Mission. 2. Convert Mission / 680 to Partial Cloverleaf. 3. Eliminate NB 680 to WB Mission and SB 680 to EB Mission.	

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D - SCOTTCREEK/DIXON LANDING											✓	✓	✓				
D1 - Milmont Route		✓														1. Kato & D Landing (Both Under BART). 2. Design Scott/Kato profile for 30 mph (48 km/h).	
a) S-Alt32-51-G2P1r1.dwg	Widen/At-grade			✓			-	✓								1. 2 LN SB off ramp? @680? 2. (N) R/W & Sound Walls between W Springs & I-680? 3. LT to Yampa & Reisling needed. 4. Improvements at 680? 5. Design Scott Profile for 25 mph design speed. 6. Widen SB 680 ramps to accommodate 2 lanes. 7. 1 m Median at Scott.	32,51
D2 - HOV W/Kato => 880		✓															
a) S-Alt.27-G3P1.dwg			N/A	N/A			-									1. Same as D3 (a).	~~27~~
b) S-Alt.27-G4P1.dwg			N/A	N/A			-									1. D2 (b). Preferred.	~~27~~
c) S-Alt.27-G5P1.dwg			N/A	N/A			-									1. HOV doesn't work due to future columns at I/C.	~~27~~
D3 - Kato West of 880		✓														1. D1A Plus Kato improvements W of 880.	
a) S-Alt.27-G2P1.dwg*†	Kato Over I-880		✓	✓	✓	N/A	EB 2 T WB 2 T	✓								1. Revised Proposed Fremont Blvd. Per City's Plan. 2. Include widening of Scott till I-680 from D1A. 3. Show toe of slope-fill (e of I-880) & retaining walls (w of I-880) for Kato extension. 4. Tower near Kato relocated as part of 880 I/C improvements. Consider impacts on Kato Road.	27

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† Recommended Alternative

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E - CALAVERAS BLVD											✓	✓	✓				
E1 - Widen to 6 Lanes	Widen/At-grade	✓															
a) C-Alt.28- G1P1.dwg*†			✓	✓	✓	EB 2 T WB 2 T	EB 3 T WB 3 T	✓	✓	N/A				2	2	1. Widen Calaveras to 6 lanes from Abel St. to Milpitas Blvd. 2.Add E1 (b). 3. Check City plans-Milpitas and Calaveras I/S. Lanes not lined correctly? 4. WB Calaveras to SB Milpitas. 5. 2 LT LN - Calaveras to SB Milpitas? 6. Add 1auxiliary lane with SW & Bike Lane in each direction (8 ln total) between Abbott & Abel. 7. WB & EB bridges (over RR) are at different elevations. 8. 2 LT LN on Serra at Abel. 9. Close Carlo St. 10. No improvements east of 680.	28
b) C-Alt.65A-G4P1.dwg			N/A	N/A			-			N/A				0	0	1. Diamond I/C at 680. E1 (b) Preferred.	~~65~~
c) C-Alt.65A-G5P1.dwg			N/A	N/A			-			N/A				0	0	1. Tight Diamond I/C at 680.	~~65~~
E2 - I/C @ Abel		✓															
a) C-Alt.28-64 G1P1.dwg	Calaveras Over Abel (at-grade).						-	✓		✓				3	0	1. Calaveras widening to 6 lanes. 2. New I/Ss on Abel St. and Main St. 3. Lose Butler LT LN. 4. Abel SB to Serra to 237 WB not a direct route. 5. Bike Blvd. on Abel. 6. Close Carlo St.	28,64
b) C-Alt.28-64 G3P1.dwg	Abel Under Calaveras (at-grade).						-	✓		✓				3	0	1. Calaveras widening to 6 lanes. 2. New I/Ss on Abel St. & Main St. 3. Modifications to 6 dwys/roads.	28,64
c) C-Alt.28-64 G4P1.dwg	Half & Half. Calaveras Up, Abel Down.						-	✓						3	0	1. Calaveras widening to 6 lanes with 1/2 and 1/2 design. Abel St. 12' down with Calaveras Blvd. 12' up. 3. SB Abel to WB 237 very important movement. 4. Consider impacts to 680 & 880 I/C's.	28,64
d) C-Alt.28-64 G5P1.dwg			N/A	N/A			-							3	0	1. Calaveras widening to 6 lanes with urban interchange at Abel St.	28,64
e) C-Alt.28-64 G6P1.dwg			N/A	N/A			-							3	0	1. Calaveras widening to 6 lanes with 1/2 and 1/2 urban interchange at Abel St. Abel st. 12' down with Calaveras Blvd. 12' up.	28,64

* Alternative Plotted for Conceptual Study Report.

† Recommended Alternative

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E3 - (N) HOV Freeway		✓															
a) C-Alt.16-G1P1.dwg	Elev. 2 Lanes Freeway (HOV Only)		✓	✓		EB 2 T WB 2 T	EB 4 T WB 4 T	Y		N/A				1	0	1. HOV from 237 to 680 North only. 2. Finalize HOV tie-in @ 880 & 237. (June 2003). 3. Consider HOV to 880 SB & then to 237.	16
b) C-Alt.16-G2P1.dwg			N/A	N/A			-							1	0	1. HOV from 237 to 680 North & South	16
c) C-Alt.16-G3P1.dwg*	Elev. 2 Lanes Freeway (HOV Only). ALT. ALIGN.		Y ?	Y ?		EB 2 T WB 2 T	EB 4 T WB 4 T	Y								1. HOV from 237 to 680 North only. 2. Keep Elevated HOV on Calaveras, At Grade near City Hall. 3. Finalize HOV tie-in @ 880 & 237. 4. Same 680 Connectivity as E3A but tie-in along Calaveras. 5. Move HOV lanes to the center, add note on wb237/calaveras 237	16
d) C-Alt.16-G4P1.dwg	Elev. 2 Lanes Freeway (HOV Only). ALT. ALIGN.															1. HOV from 237 to 680 North only. 2. Keep Elevated HOV on Calaveras, At Grade near City Hall. 3. Finalize HOV tie-in @ 880 & 237. 4. Same 680 Connectivity as E3A but tie-in along Calaveras. 5. Move HOV lanes to the center, add note on wb237/calaveras 237 merge issue, modify/add descriptions to sections. 6. HOV lanes to LEFT of LT lanes @ Milpitas I/S.	16

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F - MONTAGUE EXPRESSWAY											✓		✓				
F1 - Widen to 8 Lanes		✓	N/A	N/A	✓		-				~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~1. By others (HMH)~~	
F2 - I/C @ Great Mall		✓															
a) MO-Alt.68-G3P1-Option 1.dwg			N/A	N/A			-							1		1. Mont. Depressed/BART At Grade/Great Mall At Grade - REMOVED	~~68~~
b) MO-Alt.68-G4P1-Option 2.dwg			N/A	N/A			-							2		1. Mont. Depressed/BART At Grade/Great Mall Overhead- REMOVED	~~68~~
c) MO-Alt.68-G5P1-Option 3.dwg			N/A	N/A			-									Mont. Depressed/BART Depressed/Great Mall At Grade.	~~68~~
d) MO-Alt.68-G6P1-Option 4.dwg	Single Point I/C		N/A	N/A			-	✓								1. Mont. at grade/BART Depressed/Great Mall Overhead. 2. Use HMH Option. 3. Minimize impact to Heald College. 4. Most likely will happen. 5. Entire Expway System Priority Not Met. Co. Roads & Airports would still support it. 6. Impacts of BART Park N Ride Lot? 7. Separate County traffic from freeway traffic. 8. Consider direct (elevated) 680 to 880 connector. 9. Modeling/LOS suggests no HOV. 10. Montague at grade proposed 8-lane mixed flow facility. HOV concept would make it a 10-lane facility. 11. HOV planned only between 880 & 101.	68
e) MO-Alt.68-G7P1-Option 5.dwg	Single Point I/C						-	✓								1. Mont. at grade/BART Depressed/Great Mall Overhead. 2. Modify F2(d) to F2(e). 3. Use HMH Option. 4. Minimize impact to Heald College. 5. Most likely will happen. 6. Entire Expway System Priority Not Met. Co. Roads & Airports would still support it. 7. Impacts of BART Park N Ride Lot? 8. Separate County traffic from freeway traffic. 9. Consider direct (elevated) 680 to 880 connector. 10. Modeling/LOS suggests no HOV. 11. Montague at grade proposed 8-lane mixed flow facility. HOV concept would make it a 10-lane facility. 12. HOV planned only between 880 & 101.	68
F3 - HOV Conn. To 880/680		✓															
a) MO-Alt.XX-G1P1.dwg							-									1. Develop on aerial only. DISCONTINUED?	XX

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b) MO-Alt.XX-G2P1.dwg	At-grade HOV CONN						-	✓								1. HOV At-grade. I-680 SB & NB on/off-ramps, exclusive lane. Montague WB & EB. 2. Montague-Frontage or C-D road for local access.	XX
b1) MO-Alt.XX-G21P1.dwg	C-D System w/HOV At-grade (HOV CONN)						-	✓								1. HOV At-grade. I-680 SB & NB on/off-ramps, exclusive lane. Montague WB & EB. 2. Montague-Frontage or C-D road for local access.	
b2) MO-Alt.XX-G22P1.dwg	C-D System w/HOV At-grade (HOV CONN)-Barrier						-	✓								1. HOV At-grade. I-680 SB & NB on/off-ramps, exclusive lane. Montague WB & EB. 2. Montague-Frontage or C-D road for local access. BARRIER HOV LANES.	XX
c) MO-Alt.XX-G3P1.dwg	Elevated HOV CONN		✓					✓								1. HOV Elevated. I-680 SB & NB on/off-ramp exclusive lane. Montague WB & EB. 2. Montague-Frontage or C-D road for local access.	XX
d) MO-Alt.XX-G4P1.dwg	Direct HOV CONN			✓		EB 3 T WB 3 T	EB 5 T WB 5 T	✓								1. Median I-680 Direct HOV CONN. I-680 SB to WB Montague & I-680 NB to EB Montague.	XX

* Alternative Plotted for Conceptual Study Report.

† Recommended Alternative